

Introduction to Triangles

Objective

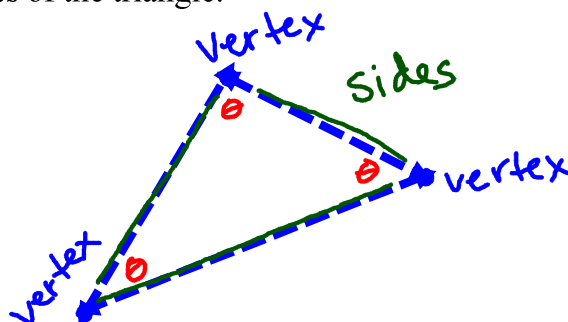
Learn basic properties of triangles.

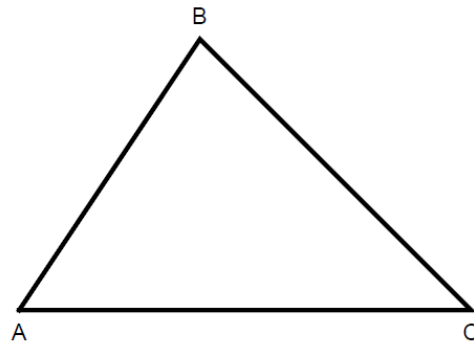
What is a triangle?

A **triangle** is the figured form by three segments joining three noncollinear points.

Each of the three points is called a **vertex** of the triangle (the plural of vertex is vertices.)

The segments are the **sides** of the triangle.





$\triangle ABC$

Triangle ABC ($\triangle ABC$) is shown.

The vertices of $\triangle ABC$ are the points A, B, C

The sides of $\triangle ABC$ are the segments \overline{AB} , \overline{BC} , \overline{CA}

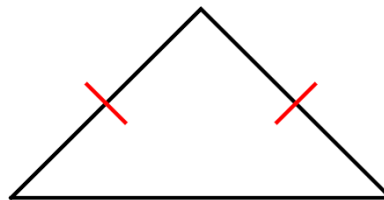
The angles of $\triangle ABC$ are $\angle A$, $\angle B$, $\angle C$ (we can refer to them by their vertex since there is only one angle at that point.) $\angle BAC$, $\angle ABC$, $\angle ACB$

Classifying by sides

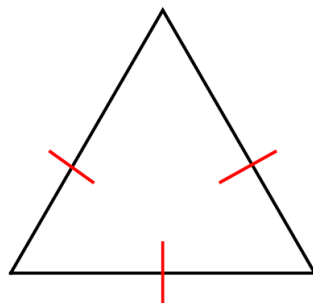
We often classify triangles by the number of congruent sides it has.



Scalene triangle
No sides congruent



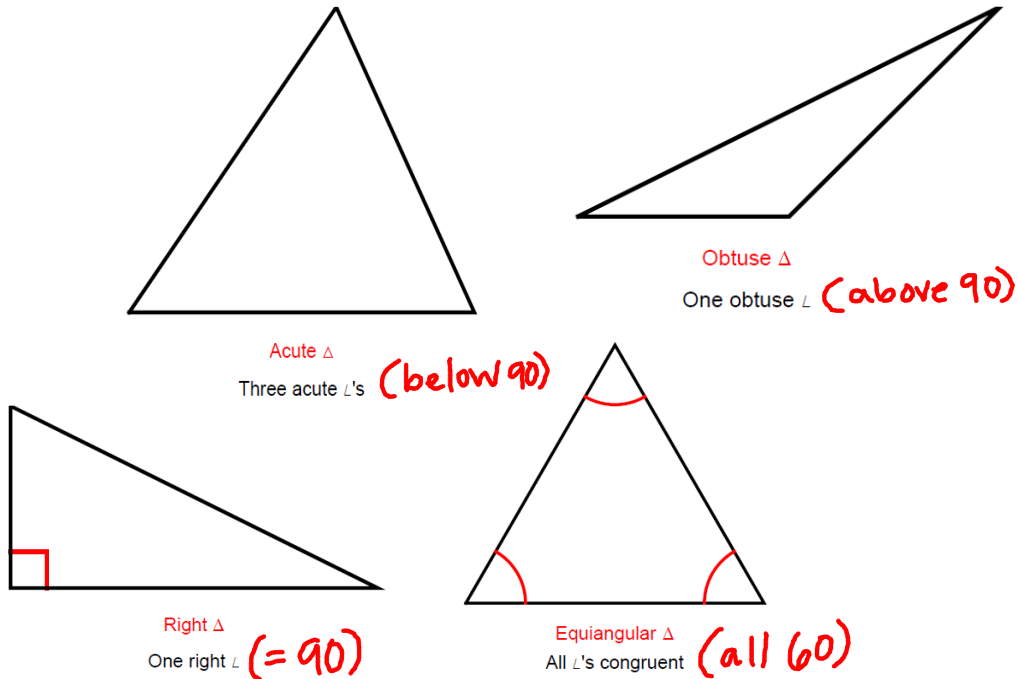
Isosceles triangle
At least two sides congruent



Equilateral triangle
All sides congruent

Classifying by angles

We also classify triangles by their angles.



Properties of Triangles

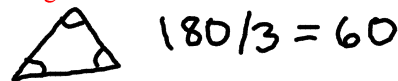
Theorem: All interior angles in a triangle add to be 180 degrees.

There are four corollaries to this theorem:

Corollary 1 If two angles of one triangle are congruent to two angles of another triangle, then the third angles are congruent.



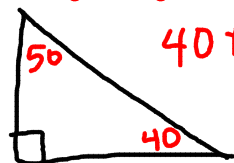
Corollary 2 Each angle of an equiangular triangle has measure 60.



Corollary 3 In a triangle, there can be at most one right angle or obtuse angle.

$$\theta = 90 \quad \theta > 90$$

Corollary 4 The acute angles of a right triangle are complementary.



$$40 + 50 = 90$$

$$\begin{array}{r} 180 \\ - 90 \text{ (right } \angle) \\ \hline 90 \end{array}$$

One more theorem: The measure of an exterior angle of a triangle equals the sum of the measures of the two remote interior angles.

